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ABSTRACT

Using the Delphi technique, impressions were gathered for a sample of 96 educators on their expectations of what media-related competencies would be required of teachers in coming decades. The educators were a nonstratified random sample chosen to represent grassroots and expert respondents, all levels of education, and a number of areas of expertise. Respondents were asked to consider media-related innovation and to predict the decade in which the technique would gain wide acceptance. Each item was also rated for desirability. Such items as the validation of commercially prepared materials, the changing role of the librarian, parent and pupil participation in instructional planning, and on-demand publishing of textbooks from data bases prepared by educators were seen to be highly probable. Complete tabular results are included in the appendix. (EMH)

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A STUDY OF SELECTED FACTORS AFFECTING MEDIA-RELATED COMPETENCIES FOR TEACHERS, 1974-2000 A.D.

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Since it has become voguish to demand that pre-service teacher preparation include competencies in the use of instructional media, and since such competencies have not been carefully defined, it was the purpose of this study to identify information from a panel of respondents that would supply input about the educational and technological environments in which teachers in grades K-12 will operate between 1974 and 2000 A.D. Developments and changes which may be expected to occur in education and which may affect the media-related competencies needed by teachers were studied by use of the Delphi method as developed by Helmer (1967), Dalkey (1970) et al.

It was recognized that a definition of competencies based on audits of current teacher performance would be inadequate to meet the changes which may be expected in teacher roles by the turn of the century; therefore it was decided to query educators at both expert and grassroots levels to ascertain their thinking about developments in education which will affect the quantity and categories of media-related competencies needed by teachers. For maximum usefulness, a definition of actual competencies appeared to be premature and less generally applicable than a study of selected environmental factors.

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Relatively few studies have been done on the topic of media-related competencies for teachers; and none since Torkelson (1965), Meierhenry (1966), Teacher Education and Media Project of the American Association of Colleges for Teacher Education (1968), and DeKieffer (1970).

METHODOLOGY

Since the study was to be future oriented, descriptive, and indicative of the thinking of educators concerning the educational environment within which teachers will work in the next quarter century, the Delphi method was chosen. A primary reason for using it was the opportunity which it provides for feedback to and reconsideration by the respondent. Since total universe of respondents was unknown, a non-stratified random sample of 96 respondents was chosen to represent grassroots and expert respondents, all levels of education, and a number of areas of expertise: school administration, libraries, media technology, television, and subject disciplines. Grassroots respondents were arbitrarily defined as persons working in schools at the campus or district level. Expert respondents were arbitrarily defined as persons in activities related to education but whose position gave them a somewhat broader perspective; the expert category included publishers/producers, educational television programmers, federal and state government employees, college professors and researchers, and officers or executives of a wide variety of professional organizations.

Following Weaver's (1971) example, initial questions for the first round were prepare by the investigator, using as a basis, the Delphi study by Farrell (1971) and the forecasting study done for the Texas Education Agency (1972). Questions were less general than in the aforementioned studies and attempted to particularize some of the general trends suggested by those two studies. The 46 initial questions may be categorized into the

following broad groups: school location and curriculum organization/ implementation, pupil-teacher interaction, teacher's roles, teacher preparation of learning materials, prepackaged media, availability of learning resources, use of mass media and related technologies, accountability, and the roles of specialized personnel.

Respondents were asked to check the decade which they felt represented the date by which the development expressed in an item would be widely accepted and would be operational in a majority of situations. At the end of the first round, respondents added six more questions. Two rounds of questioning were used. On the first round, the number of instruments returned was 40.6% and on the second round 69.23%.

Questionnaires which were returned were distributed among the various sub-groups of the population and on a geographical basis in almost the same proportions as those used in the initial sample.

Prior to data analysis, "consensus" was defined as having been reached when 50% or more of respondents agreed upon implementation of a given item within a single decade. On the second round of questions, respondents were also asked to indicate the level of desirability that they perceived for each item should it be implemented in the schools; a desirability level was computed for each item and is shown in Appendix A.

Assuming that an early date of implementation indicated that a respondent was fairly optimistic about implementation of an item and that a later date indicated a less optimistic attitude, mean scores on an optimism/ pessimism score for each item were computed for purposes of comparison. A low mean score indicated a fairly optimistic attitude on the part of respondents and a high score a more pessimistic assessment. All items which respondents expected to occur scored at or below the mid-point on the

optimism/pessimism scale.

Because of the small size of the sample, data on responses of sub-groups of respondents were not analyzed statistically.

FINDINGS

Items on which respondents reached consensus.- Respondents reached the consensus level on eleven items on the first questionnaire. Of these eleven items, two were viewed as never occurring and as highly undesirable; they are items 34 and 5 on page one of Appendix A. The item receiving the highest level of consensus (expected between 1981 and 1990) had to do with cost effectiveness data being supplied for all commercially prepared learning materials. Respondents reached consensus on four items related to accountability on the first round.

On the second round of questions, four items received a consensus agreement of 75% or more; they dealt with validation of commercially prepared learning materials (item 29), a changed role for school librarians (item 49), parent and pupil participation in instructional planning (item 11), and the advent of on-demand publishing of textbooks from data bases prepared by educators rather than by publishers (item 31).

Desirability levels.- Based on the dates by which items were expected to be implemented in schools and compared with desirability scores, some dissonance was evident. Two items about extensive use of mass media (items 38 and 39) received moderately undesirable ratings yet were forecast for implementation before 2000. All items related to accountability tended to be considered as less desirable even though respondents reached consensus on all but one accountability item. No attempt was made in this study to ask respondents to account for the dissonance reflected in some of their responses, but further information on this point appears to be essential in

developing an attitudinal set receptive to the rather massive changes that will be required should the accountability items be implemented by the dates at which respondents expect them.

Comparison of responses of sub-groups of respondents.- Responses were analyzed according to sex of respondents, level of education at which they work, self-determined area of expertise, and whether the respondent was considered as grassroots or expert. Space does not allow detailed analysis in this paper.

No appreciable differences were determined between the responses of male and female respondents.

It was found that respondents working at the grassroots level expected implementation of changes earlier than did expert respondents. They showed less variance in their responses. There was almost no difference between them and experts in scores for levels of desirability or on optimism/pessimism scores.

Respondents at the elementary level forecast implementation of developments earlier, agreed among themselves more, agreed with the consensus level more frequently, and found changes more desirable than any other group of respondents. Personnel in higher education were most pessimistic about when changes would occur.

Persons in various areas of expertise differed considerably in both the anticipated timing of change and in their judgments of its desirability. Media technologists agreed among themselves more than any other subgroup. Television experts expected changes earlier than other respondents. Librarians and media technologists are the next most optimistic groups and little difference was found among their responses. Administrators indicated more diverse responses. Persons working in curriculum, psychology,

and teacher education were more pessimistic about implementation of study items and found the items less desirable.

SOME OBSERVATIONS AND COMMENTS

Perhaps the more cautious responses from expert respondents and from higher education personnel may be attributed to a broader understanding of the complexity of educational change.

Of the 39 items on which respondents reached consensus, 24 were forecast for implementation between 1981 and 1990, indicating that respondents expect rather sweeping and rapid change between seven and seventeen years from the date of this study. Considering that within that decade, a large majority of teachers who are now teaching in schools will continue to teach, the early and rapid changes which were forecast by respondents is somewhat surprising. Apparently respondents believe that it will be possible to effect major changes in attitude and major retraining in teachings skills among teachers and administrators who are already engaged in the profession. These rather optimistic forecasts for change imply massive and intense programs of in-service education as well as extensive changes in teacher education programs. In light of the fact that the respondents who were most pessimistic about effecting changes were those in teacher education, curriculum, and psychology, the possibility of effecting the needed changes in teacher preparation programs becomes questionable.

Consensus on the accountability items in the study would indicate that supporters of education through the tax structure will be more demanding of results for the funds invested. More appropriate methodologies and models for such assessment must be developed.

A comparison of this study with Stoops (1960) and Meierhenry et al (1966)

indicates that the Meierhenry study in 1966 was an extremely forward-looking document. The major changes between it and this study were in the emphases placed on accountability and cost effectiveness of education activities in the current study.

The data presented by this study, must, first of all, be taken only as indicators of the direction in which instruction may move in the next decade; the indicators assume a stable social system and do not account for major technological revolution with the exception of interactive, natural language computer systems. Problems which are immediately apparent are the speed with which respondents anticipate change but the fact that administrators and persons who work in state and federal education agencies seem to find less desirability in such changes. However, the highly optimistic and cohesive responses of grassroots respondents who will eventually be responsible for change at the instructional level may offset other attitudes. Another positive factor was the high level of agreement among persons working directly with learning media and with teachers: media technologists, television specialists, and librarians.

Perhaps some indicators for future exploration have been suggested by this effort.

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APPENDIX A

The following excerpts from the total study represent opinions of respondents as a whole. The level of concensus is underlined in each table. The desirability level represents mean responses on a scale of one through ten with one representing a highly desirable development and ten representing a highly undesirable one.

TABLE 1

PERCENTAGE OF RESPONSES IN EACH SPAN OF DATES FOR ITEMS ON WHICH RESPONDENTS REACHED CONSENSUS AT 50% LEVEL OR ABOVE ON FIRST QUESTIONNAIRE

Item	Percentage of Responses					Mean Desirability Level
	1974-1980	1981-1990	1991-2000	After 2000	Never	
46. Cost effectiveness data are supplied for all commercially prepared learning materials.	2.6	<u>65.8</u>	15.8	10.5	5.3	3.3
45. Pupil learning measured in quantifiable terms provides the data used in determining the efficiency and cost effectiveness of a given instructional program.	5.6	<u>61.1</u>	16.7	8.3	8.3	4.4
34. Teachers who require their pupils to read books and journals are considered old-fashioned.	6.3	15.6	9.4	12.5	<u>56.3</u>	7.5
5. The process by which the centrally prescribed curriculum is implemented is prescribed by a centralized instructional planning agency.	5.4	16.2	13.5	10.8	<u>54.1</u>	8.8
48. Accountability models are applied to various combinations of materials, teacher activities, and pupil activities to determine those combinations that are most efficient and cost effective.	3.1	<u>53.1</u>	2.5	15.6	3.1	3.1

Item	1974-1980	1981-1990	1991-2000	After 2000	Never	Mean Desira Level
47. Cost effectiveness data are gathered and analyzed for teacher made learning materials.	2.7	51.4	32.4	8.1	5.4	3.3
7. A "course" is a series of teacher designed, individualized modules which pupils may complete in varying lengths of time.	26.3	50.0	15.8	5.3	2.6	3.1
14. Teachers prepare alternate methods and materials by which a given pupil may achieve the objectives of a learning module.	34.2	50.0	10.5	0.0	5.3	2.3
25. Teachers use audio or video format to comment on and evaluate pupil work.	26.3	50.0	13.15	7.8	2.6	3.5
30. On demand publishing produces textbooks which teachers design for individual pupils. These may be in the form of pamphlets, single chapters, microforms, audio-tapes, loose leaf pages, etc.	13.2	50.0	23.7	10.5	2.6	2.1
35. School learning resources are available to all persons in the community, not just to school age pupils.	18.4	50.0	28.9	2.6	0.0	1.9

TABLE 2

RESPONSES TO ITEMS ON WHICH CONSENSUS AT 50 PERCENT LEVEL OR ABOVE WAS REACHED ON SECOND QUESTIONNAIRE IN DESCENDING ORDER OF PERCENTAGE OF AGREEMENT

ITEM	1974-1980	1981-1990	1991-2000	After 2000	Never	Mean Desirability Score
29. Commercially prepared prepackaged instructional materials are validated and purchasers are supplied with full validation information	4.0	80.0	12.0	4.0	0.0	1.55
49. Rather than working directly with students, learning resources specialists work primarily with teachers in designing instruction.	8.0	80.0	4.0	4.0	4.0	3.46
11. Parents and pupils determine (with teachers) the educational experiences that the pupil will have.	4.0	76.0	16.0	4.0	0.0	2.59
31. The content of the data base from which on-demand publishing is done is determined by curriculum specialists and teachers rather than by publishers.	0.0	76.0	20.0	4.0	0.0	1.48
9. Pupils participate in preparation (with teachers) of individually prescribed objectives.	29.2	70.8	0.0	0.0	0.0	1.87
52. Life skills education is incorporated in the standard curriculum.	34.8	65.2	0.0	0.0	0.0	2.23
28. Teachers and pupils have access to a large variety of prepackaged instructional materials and information sources.	32.0	64.0	0.0	4.0	0.0	1.67

ITEM	1974-1980	1981-1990	1991-2000	After 2000	Never	Mean Desirability Score
40. Satellite transmission systems allow simultaneous participation in group learning by pupils geographically separated by long distances.	4.0	12.0	64.0	20.0	0.0	6.59
41. Different approaches to instruction are vigorously evaluated and ineffective methods and materials are weeded from the system.	0.0	64.0	20.0	4.0	12.0	1.78
21. Teachers select a medium for communicating given content to a given pupil on the basis of the characteristics of the medium and of the pupil.	8.0	60.0	28.0	4.0	0.0	1.96
32. Teachers use on-line data bases that identify instructional materials for a given purpose and report evaluations of the materials.	0.0	8.0	60.0	8.0	0.0	2.22
42. Schools vie for patrons with the demonstrably more effective schools able to attract pupils and public support while the less efficient ones close.	0.0	12.0	60.0	8.0	20.0	3.85
50. Although teachers plan and design the content of materials, the majority of production is done by technicians.	16.0	60.0	16.0	8.0	0.0	2.41
8. Pupils take courses without class attendance through two-way television.	0.0	58.3	20.8	12.5	8.3	4.35
39. The mass media comprise the major form for the dissemination of content used in courses.	0.0	8.3	58.3	20.8	12.5	6.78

ITEM	1974 1980	1981- 1990	1991- 2000	After 2000	Never	Mean Desirability Score
24. Teachers test and revise materials that they prepare in order to validate them for future use.	56.0	32.0	4.0	4.0	4.0	1.77
27. Pupils have access to facilities and participate in the preparation of communications media for their own and teacher's purposes.	4.0	32.0	56.0	4.0	4.0	2.19
18. Teachers select information about each pupil that is input into computer managed programs for the prescription of pupil's learning needs.	0.0	33.3	52.2	17.4	0.0	3.65
17. Diagnosis of and prescription for pupil's learning needs are done primarily by computer managed programs rather than by teachers.	16.0	52.0	28.0	4.0	0.0	5.22
20. Professional educators are provided with a staff of specialized support personnel much as medical doctors today have such support personnel.	0.0	52.0	32.0	16.0	0.0	2.11
23. Teachers design and write programmed or computer assisted instructional sequences for use by individual pupils.	8.0	28.0	52.0	8.0	4.0	2.81
33. Teachers use on-line data bases that identify instructional materials for a given purpose and report evaluations of the materials.	0.0	44.0	52.0	4.0	0.0	2.37

ITEM	1974-1980	1981-1990	1991-2000	After 2000	Never	Mean Desirability Score
36. Rather than school libraries, pupils use public libraries as their major source of materials.	4.0	12.0	20.0	12.0	52.0	3.59
44. The efficiency of school organizational structure is determined by application of accountability models to its organizational behavior.	8.0	52.0	24.0	12.0	4.0	3.93
51. Pupils and technicians (rather than teachers) operate equipment for viewing, listening, recording, reproduction, etc.	52.0	44.0	4.0	0.0	0.0	2.54
2. Pupil learning occurs in many locations, the majority of organized learning activities taking place outside the school.	0.0	50.0	40.9	9.1	0.0	3.16
10. Pupils participate (with teachers) in the design of learning experiences to meet their individual needs.	45.8	50.0	0.0	0.0	4.2	1.73
26. Media provide immediate feedback on most pupil learning (i.e., computer mediated instruction, two-way cable television, other response systems).	0.0	41.7	50.0	8.3	0.0	2.62
56. Teachers use media to facilitate the instruction of students experiencing no learning difficulty, thus giving these students less of the teacher's attention.	29.2	50.0	4.2	12.5	4.2	3.96

TABLE 3

PERCENTAGES OF RESPONDENTS FORECASTING EACH DATE FOR ITEMS ON WHICH RESPONDENTS REACHED 40-49 PERCENT LEVEL OF AGREEMENT

Item	1974-1980	1981-1990	1991-2000	After 2000	Never	Mean Desirability Score
4. Curriculum planning is centralized in a state agency which prescribes broad goals for learners.	8.7	21.7	17.4	4.4	48.6	8.58
12. Most instruction is by means of television, computer assisted instruction, and other technology not controlled by the classroom teacher.	0.0	0.0	8.0	44.0	48.0	7.96
15. Teachers act as tutors and counselors for pupils who receive information and information and instruction via television/video recording, long range image transmission, telelectures, and other technologies.	0.0	48.0	40.0	12.0	0.0	3.63
16. Teachers plan and manage the learning process but allow media in many formats to function as presentors of information.	36.0	48.0	16.0	0.0	0.0	2.37
19. Teachers have overcome apprehension toward use of both present and future technology through intensive use of it in their own teacher preparation programs.	0.0	36.0	48.0	12.0	4.0	2.59
38. The mass media are assigned responsibility for a major part of the early childhood education of pupils.	8.0	48.0	28.0	8.0	8.0	5.78

TABLE 4

PERCENTAGES OF RESPONDENTS FORECASTING EACH DATE FOR ITEMS ON WHICH RESPONDENTS REACHED LESS THAN 40 PERCENT LEVEL OF AGREEMENT

Item	1974-1980	1981-1990	1991-2000	After 2000	Never	Mean Desirability Score
6. The process by which the centrally prescribed curriculum is implemented is determined by individual teachers.	20.8	16.7	16.7	8.3	37.5	4.77
13. Professional roles are differentiated so that one teacher is a specialist in learning theory, another in designing learning sequences, another in evaluation.	0.0	24.0	36.0	32.0	8.0	6.37
53. Teachers are educated more thoroughly in a subject discipline than in methodologies of teaching.	34.8	26.0	8.7	8.7	21.8	5.44
57. Teachers work individually and extensively with students who need unique instructional treatment, allowing most pupils to use media for self-instruction.	25.0	33.3	25.0	16.7	0.0	3.52
37. Flexibility in the use of funds is common place; i.e., funds are no longer categorized as personnel, capital outlay, materials, but can be spent in whatever way is deemed appropriate to accomplish the objectives of the school.	4.0	12.0	28.0	28.0	28.0	3.22

Item	1974-1980	1981-1990	1991-2000	After 2000	Never	Mean Desirability Score
3. Instruction focuses primarily on the process by which problems are solved rather than on content.	4.2	41.7	45.8	4.2	4.2	2.58
43. Accountability models based on pupil learning are used to evaluate the competence and performance of teachers.	8.0	44.0	36.0	4.0	8.0	4.11
1. School ceases to be a definable place or location and is a concept.	0.0	0.0	17.4	39.1	43.5	4.96
55. Pupil prograss is reported in terms of specific competencies rather than by grading on courses.	37.5	41.7	20.8	0.0	0.0	2.00
54. Educational technologists (learning resources specialists) are accepted by teachers as helpful problem solvers.	37.5	4.17	20.8	0.0	0.0	2.00
22. Teachers plan content and method for television/video record programming to meet given learning objectives.	16.0	40.0	36.0	0.0	8.0	3.00